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MARINE DIATOMS FROM CHUBUT (ARGENTINA REPUBLIC) CENTRALES II — *THALASSIOSIRA*

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(With 27 figures)

RESUMO

Diatomáceas marinhas de Chubut (República Argentina) Centrais II – *Thalassiosira*

Oito espécies de *Thalassiosira* das águas costeiras da Província de Chubut na Argentina, foram estudadas com microscópio de varredura e microscópio óptico. *Th. minima* Gaarder representa um novo registro para a costa do Atlântico Sul e *Th. minuscula* Krasske um novo registro para a Argentina.

Palavras-chave: Thalassiosira, taxonomia, morfologia, distribuição.

ABSTRACT

Eight species of *Thalassiosira* from the coastal waters of the Province of Chubut, Argentina, were studied using both light and scanning electron microscope.

Th. minima Gaarder represent a new record for the South Atlantic Coast and *Th. minuscula* Krasske a new record for Argentina.

Key-Words: Thalassiosira, taxonomy, morphology, distribution.

INTRODUCTION

The present paper is part of a series devoted to the analysis of specific composition and time-space distribution of the diatomaceous flora in Gulf San José and Nuevo, Province of Chubut.

This paper aims to present some species from the genus *Thalassiosira*.

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MATERIALS AND METHODS

The material studied comes from the locations indicated in Fig. 1, and forms part of the collection of Marine Diatoms held in the Phycology Division of the College of Natural Sciences and Museum from the National University of La Plata. The technique used for the extraction, fixation, treatment and mounting of samples were described by Ferreyra and Ferrario (1983) and Ferrario *et al.* (in print).

The terminology used is that suggested by Ross *et al.*, 1979.

RESULTS

Family *Thalassiosiraceae*
Lebour emend. Hasle
Thalassiosira Cleve
Thalassiosira anguste-lineata
(Schmidt) Fryxell and Hasle
Figs. 2A and 3-8.
Fryxell and Hasle 1977:73-75, Pl.4,
Figs. 22-26, Pl. 5,
Figs. 27-34; Lange *et al.*, 1983:15,
Figs. 22-24.
1878. *Coscinodiscus anguste-lineata*
Schmidt, Pl. 59,
Fig. 34.

The valve surface is ornamented by areolae arranged in a lineate or fasciculate way. The valve mantle is limited by a ring of strutted processes in the shape of a tube towards the inner part of the valve and in the shape of an urn with small granulations towards the outer part, Fig. 3 and 4. There is a central strutted process, absent in some cases, and a variable number of strutted processes forming a ring between the central areola and the valve edge, Figs. 4 and 7.

One labiate process externally lengthened, Fig. 3, radially oriented, near the edge of the valve mantle, Fig. 6.

Analysed material: Argentina, Province of Chubut; San José, 10.06.81, sample nº 55; Tehuelche, 09.16.82, sample nº 78.

Measurements: diameter, 28-34μm; valve centre, areolae in 10μm, 16-18; valve mantle, areolae in 10μm, 30-34; marginal strutted processes in 10μm, 4-7.

Distribution in Argentina: Ferrario in Kühnemann, 1969:98, Puerto Deseado Estuary, Province of Santa Cruz (= *Coscinosira polychorda*). Bastida and Stupak, 1979:103, Mar del Plata Harbour, Province of Buenos Aires (= *Coscinosira* cfr. *polychorda*). Ferrario, 1980:73-75, Puerto Deseado Estuary, Province of Santa Cruz. Gayoso, 1982:21, Bahía Blanca Estuary, Province of Buenos Aires. Lange *et al.*, 1983:15, Mar del Plata Harbour, Province of Buenos Aires, 39º 05'S – 55º 43' W.

Remarks

Th. anguste-lineata presents a remarkable polymorphism in the area studied.

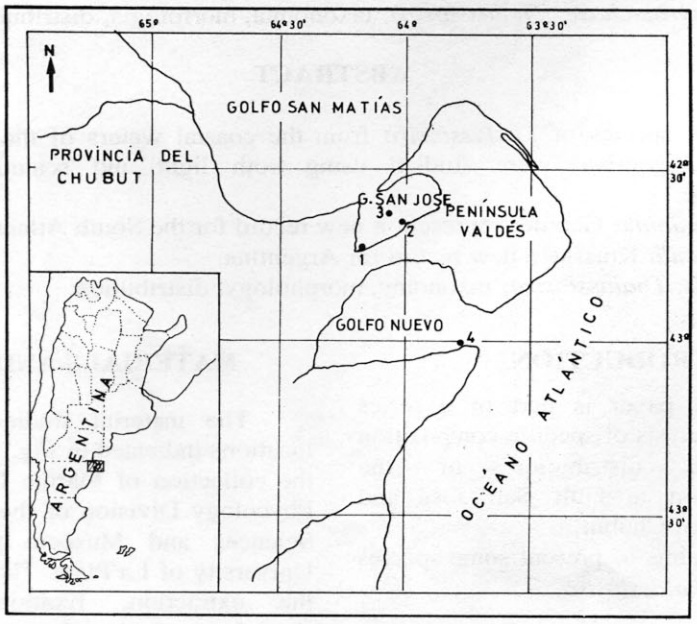


Fig. 1: map of Argentina and the area showing sampling locations: 1 – Isla de los Pájaros; 2 – Tehuelche; 3 – San José; 4 – Bahía Cracker.

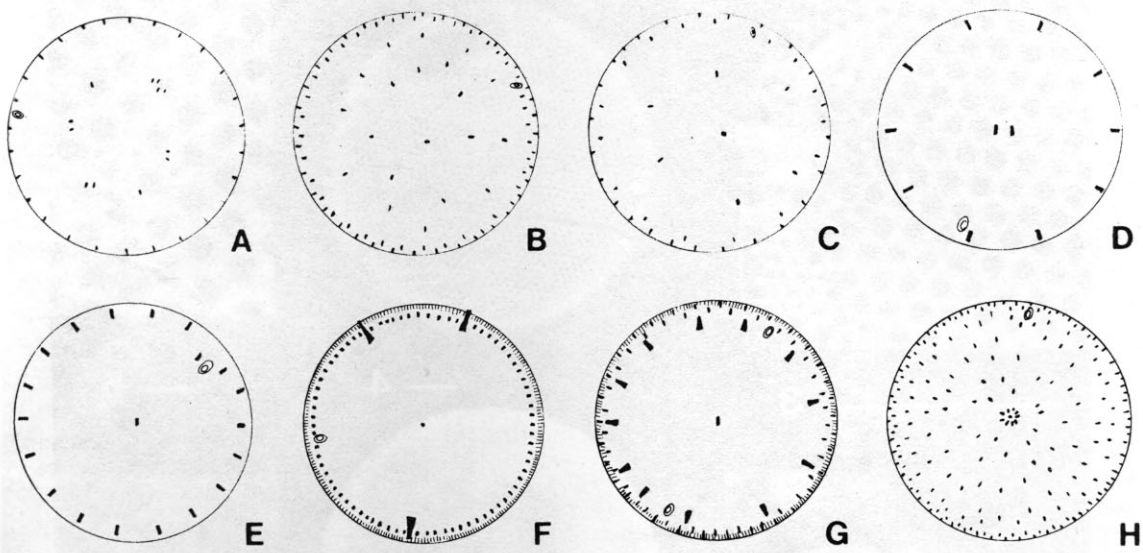


Fig. 2: Diagrammatic representation of process patterns. A – *Thalassiosira anguste-lineata;* B – *Th. eccentrica;* C – *Th. mendiolana;* D – *Th. minima;* E – *Th. minuscula;* F – *Th. punctigera;* G – *Th. simonsenii;* H – *Th. rotula.*

The smallest specimens are generally more silicified, with areolae in a linear pattern, the ring of strutted sub-central processes is not so noticeable and the strutted proccesses of the marginal ring are strong. The specimens of greater diameter are less silicified, and have areolae in a fasciculated pattern, the sub-central strutted processes ring is more noticeable and the strutted processes of the marginal ring are smaller and unconspicuous.

Thalassiosira eccentrica (Ehrenberg) Cleve
Figs. 2B and 13-16
Cleve, 1904: 216; Fryxell and Hasle, 1972: 300-312,
Figs. 1-18.
1841. *Coscinodicus eccentricus* Ehrenberg: 146.

The valve surface is flat, ornamented by areolae arranged in curved, eccentric rows, Fig. 13. the central areola is generally surrounded by seven areolae. The strutted processes are arranged as follows: one beside the central areola, Fig. 15, some scattered over the valve surface and others forming two marginal rings, Fig. 18. The labiate process is externally prolonged and located on the valve edge. There are prominent spines forming and irregular ring between the valve surface and the valve mantle, Fig. 16.

Measurements: diameter, 43.5-55 μm; valve centre, areolae in 10 μm,5-6; valve edge, areolae in 10 μm, 7-8; marginal strutted processes in 10 μm, 4.5-5; marginal spines in 10 μm, 4-5.

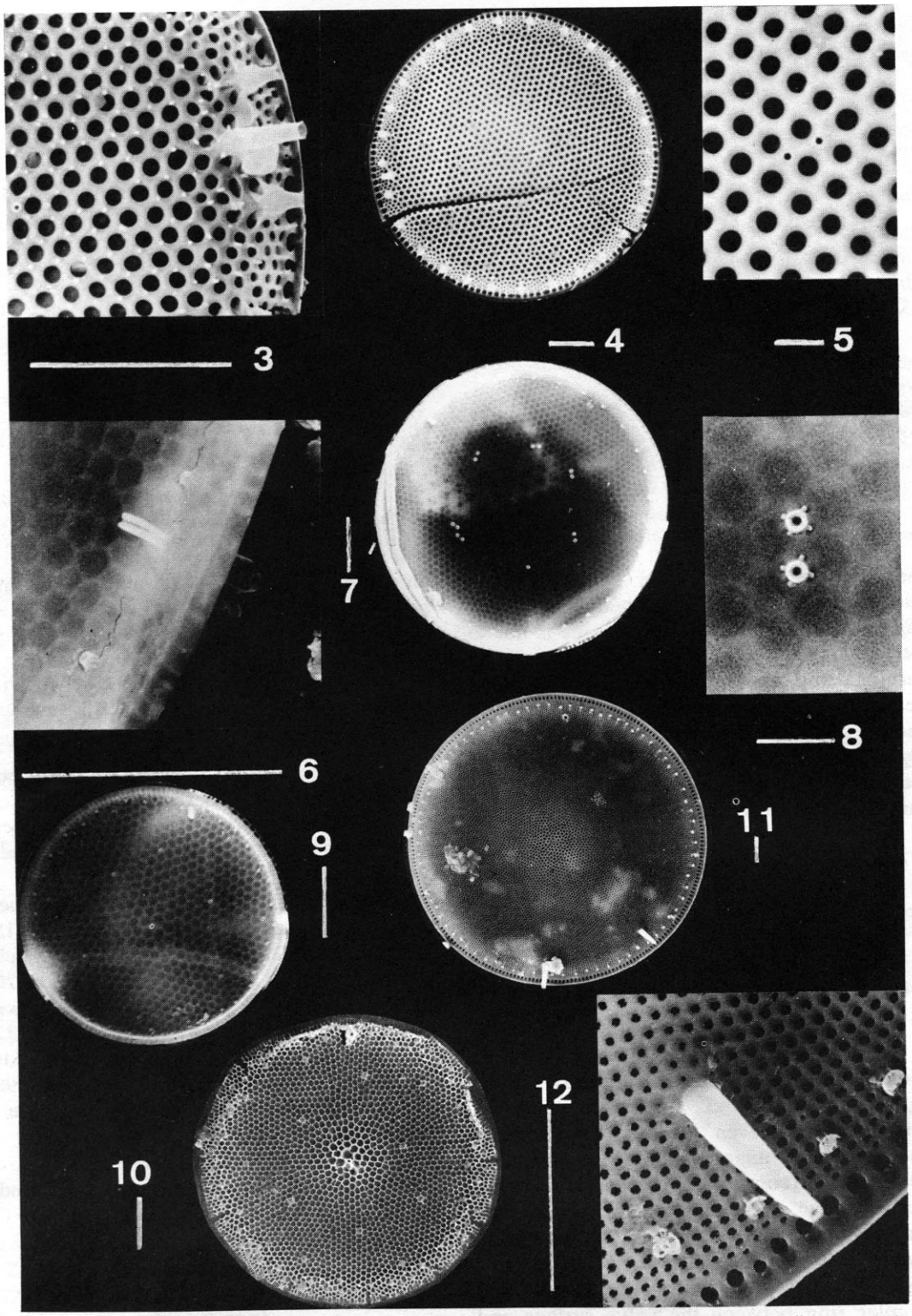
Analysed material: Argentina, Province of Chubut; Cracker Bay, 09.15.81, sample nº 50.

Distribution in Argentina: this species has been extensively described from our coast so we are mentioning only a few selected papers corresponding one to each province of the Atlantic Littoral.

Frenguelli, 1924: 57, Tierra del Fuego (=*Coscinodiscus eccentricus*); 1939a: 180, San Jorge Gulf, Province of Chubut (=*Coscinodiscus eccentricus*); 1939b; 202, San Matias Gulf, Province of Río Negro (=*Coscinodiscus eccentricus*) and 1941: 320, Rio de la Plata, Province of Buenos Aires (=*Coscinodiscus eccentricus*). Ferrario, 1980: 69-70, Puerto Deseado Estuary, Province of Santa Cruz.

Thalassiosira mendiolana Hasle and Heimdal
Figs. 2C and 9-10.
Hasle and Heimdal, 1970: 570-572,
Figs. 44, 53, 73-74;
Fryxell and Hasle, 1972: 308-310,
Figs. 22-32.

The frustules are weakly silicified. The valve surface is concave and ornamented by areolae arranged in fascicles. The central



Figs. 3-12 – Figs 3-8, *Thalassiosira anguste-lineata;* figs. 3-5, valves in outside views; figs. 6-8, valves in inside views; figs. 3 and 6, detail of strutted processes and labiate process; figs. 5 and 8, detail of strutted processes between areolae on some valve. Figs. 9-10 *Th. mendiolana;* fig. 9, valve in inside view; fig. 10, valve in outside view. Figs. 11-12, *Th. punctigera;* figs. 11 and 12, valves in outside views; fig. 12, detail of valve margin with strutted processes and one occluded process. (Scale bar: 5 μm (3, 4, 6, 7, 9 - 12) 1 μm (5, 8).

areolae are bigger than the others, Fig. 10. The valve mantle is shallow. The tubular strutted processes are not much prolonged towards both sides of the valve surface, one of them is eccentric beside the central areola, some are scattered over the valve surface and others form two or more rings on the edge, Fig. 9. The labiate process is externally prolonged, short and oblique in the mantle towards the internal part, and oriented in the direction of the stria, Fig. 9. There are little spines on the edge of the valve.

Measurements: diamenter, 26.5-28.5 μm; valve centre, areolae in 10 μm, 13; valve edge, areolae in 10μm, 17-18; marginal strutted processes in 10 μm, 4-5.

Analysed material: Argentina, Province of Chubut; San José, 10.06.81, sample nº 55; Tehuelche, 09.16.82, sample nº 78.

Distribution in Argentina: Lange, 1983: 134, 39º, 05' S – 55º 43' W; 39º 23' S – 55º 11' W and 38º 12' S – 57º 15' W; 1985: 365, 38º 12' S – 57º 15' W; 39º 59' S – 54º 11' W.

Thalassiosira minima Gaarder
Figs. 2D and 20-21
Gaarder, 1951: 31, Fig. 18; Hasle, 1976a: 331-332, Fig. 39; Hasle, 1980: 167-173, Figs. 1-17.
1972. *Thalassiosira floridana* (Cooper) Hasle, 1972a: 544.

The valve surface is concave, slightly lifted in the middle, ornamented by areolae arranged in radial fasciculated rows. The areolae of the central area are bigger than the ones on the margin. The valve mantle is shallow. The tubular strutted processes are short, prologed towards both sides of the valve surface and placed as follows: two close together on the valve centre with three satellite pores, Fig. 20, the others are arranged in a regular marginal ring with four satellite pores, Fig. 21. The labiate process is prolonged on the outside, short and radially arranged on the inside of valve and it is situated close to one of the marginal strutted processes.

Measurements: diameter, 9.9,5-10.2 μm; valve centre, areolae in 10 μm, 30; valve edge, areolae in 10 μm, 40-45; marginal strutted processes in 10 μm, 5-6.

Analysed material: Argentina, Province of Chubut; San José, 10.06.81, sample nº 55.

Distribution in Argentina: this species is mentioned for the first time for the South American Atlantic coast.

Thalassiosira minuscula Krasske
Figs. 2E and 22-23
Krasske, 1941: 262, Pl. 2, Figs. 4-6; Simonsen, 1974: 10; Hasle, 1976b: 104-105, Figs. 6-10.
1972. *Thalassiosira monoporocyclus* Hasle: 129, Figs. 46-60.

The valve is convex, slightly depressed in the centre, ornamented by areolae arranged in fascicles, Fig. 23. The valve mantle has radially elongated marginal areolae, Fig. 23. The tubular strutted processes are short, prolonged towards both sides of the surface and arranged as follows: one on the centre of the valve and the others forming a marginal ring, Fig. 22. The labiate process is prominent, radially oriented, placed inside the marginal ring of strutted processes, close to one of them, Fig. 23.

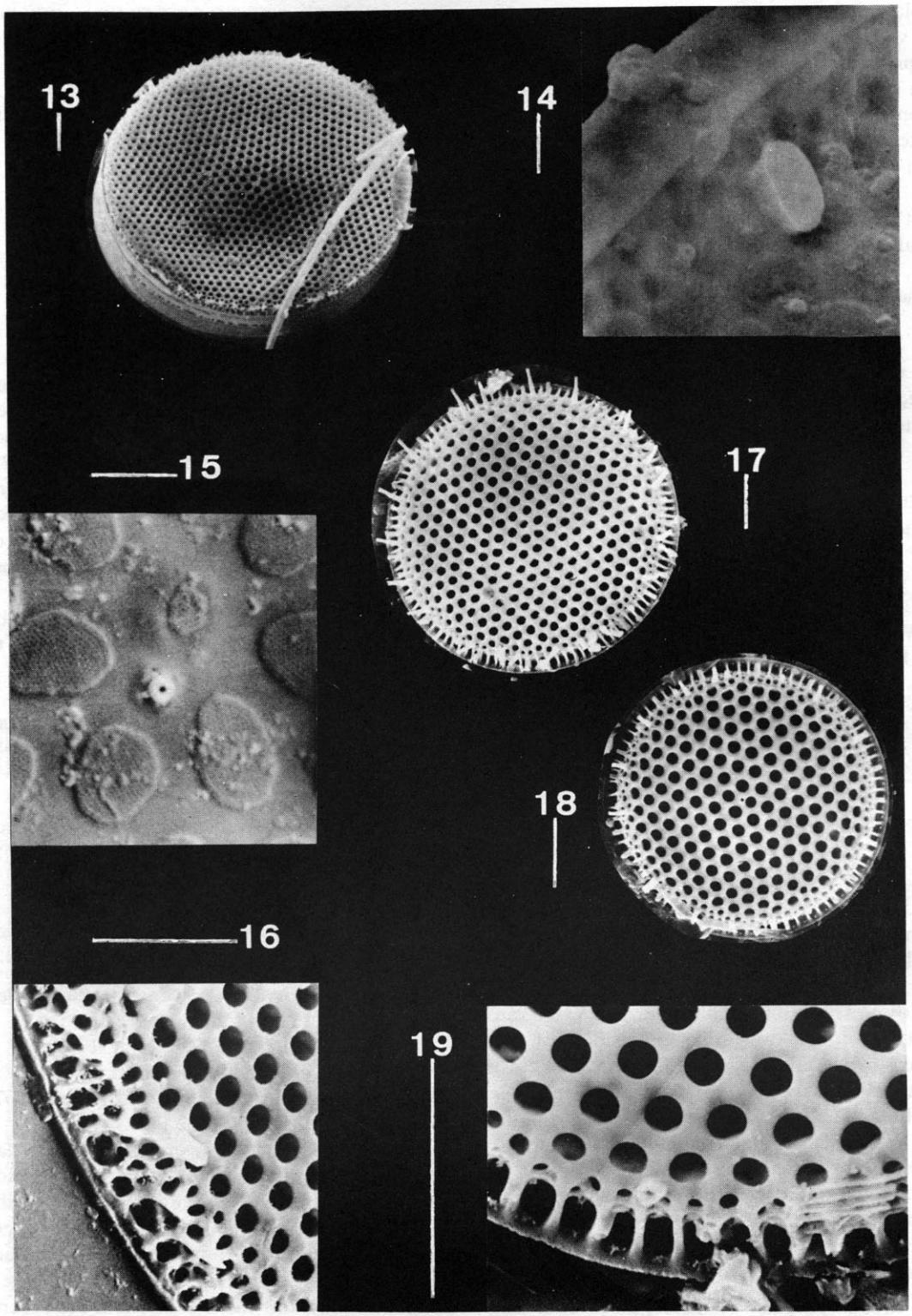
Measurements: diameter, 16-21.5 μm; valve centre, areolae in 10 μm, 40-48; marginal strutted proceses in 10 μm, 4-5.5.

Analysed material: Argentina, Province of Chubut; San José, 10.06.81, sample nº 55; Tehuelche, 09.16.82, sample nº 78.

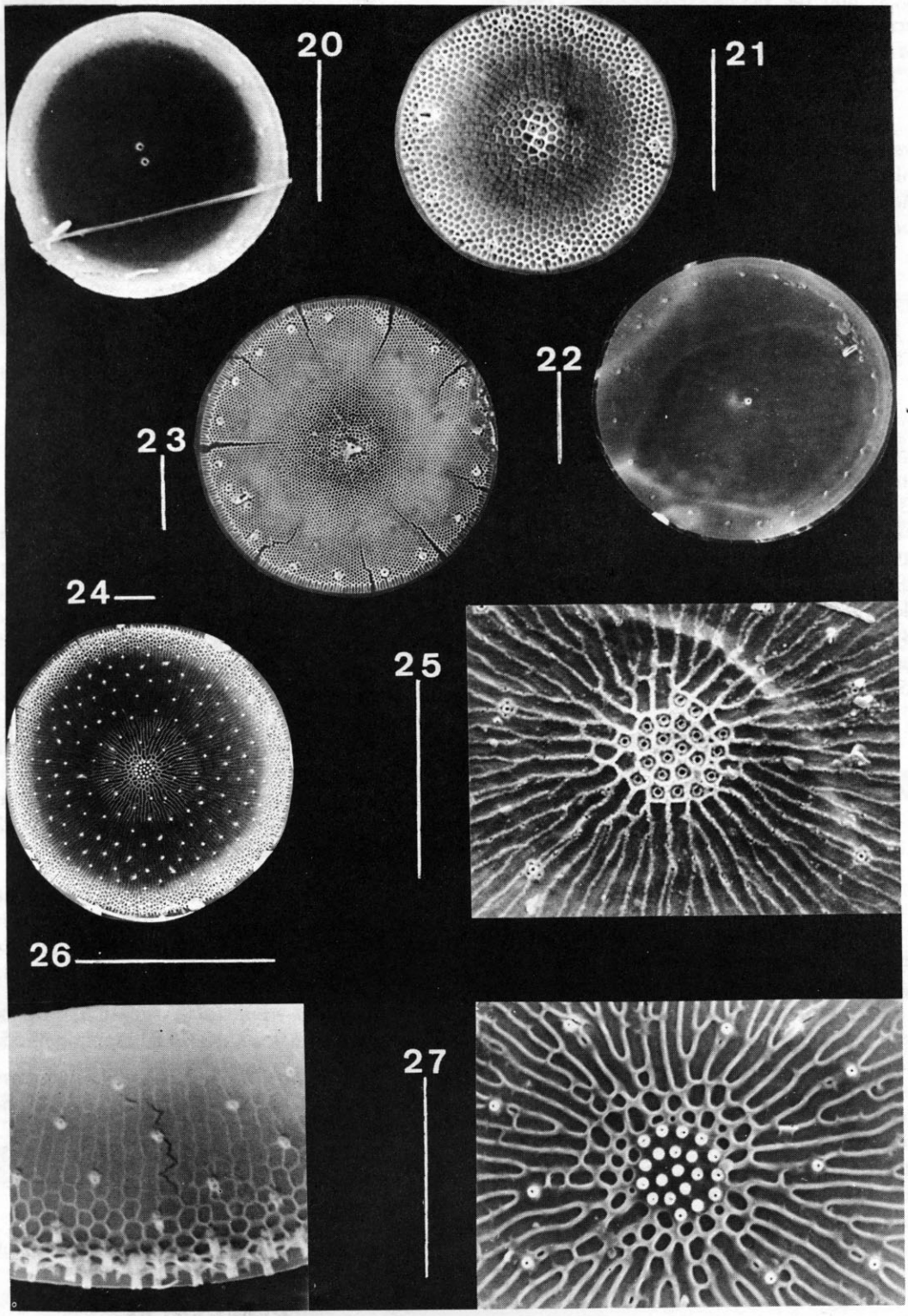
Distribution in Argentina: This species is described for the first time from Argentina.

Thalassiosira punctigera (Castracane) Hasle
Figs. 2F and 11-12
Hasle, 1983: 593-608, Figs. 1-45; Lange *et al.*,1983: 13, Figs. 7-9.
1886. *Ethmodiscus punctiger* Castracane: 167, Pl. 3, Fig. 1

The valve surface is convex with areolae arranged in fascicles and the edge with thick ribs. The areolae are partially occluded on the outside; the central areolae are bigger than the others. The valve mantle is oblique. The strutted processes are placed as follows: a tubular one on the valve centre and the others, urn-shaped on the outer part, arranged in a marginal ring, Fig. 12; one out of three or four is displaced towards de centre. The labiate



Figs. 13-19 – Figs. 13-16, *Th. eccentrica;* figs. 13 and 16, valves in outside views; fig. 16, detail of marginal processes and spines; figs. 14 and 15, inside views; fig. 14, detail of labiate processes; fig. 15, strutted process adjacent to central areola. Figs. 17-19, *Th simonsenii,* valves in outside view; fig. 19, marginal processes and ribbed valve margin. (Scale bar: fig. 5 μm (13, 16-19) 1 μm (14, 15).



Figs. 20-27 – Figs. 20-21, *Thalassiosira minima;* fig. 20, valve in inside view; Fig. 21 valve in outside view. Figs. 22-23, *Th. minuscula;* fig. 22, valve in inside view; fig. 23, valve in outside view. Figs. 24-27, *Th. rotula;* figs. 24, 26, 27 valves in outside views; fig. 25, valve in inside view; fig. 25-27, detail of central strutted processes and strutted processes scattered over the valve face; fig. 26, detail strutted processes. (Scale bar: 5 μ m).

process and the occluded processes (1-4) are externally prolonged, at a certain distance from the marginal ring of strutted processes, Fig. 11.

Measurements: diameter, 65.5-130 μm; valve centre, areolae in 10μm, 22; valve edge, areolae in 10 μm, 30; edge ribs in 10 μm, 14; striae in 10 μm, 20; marginal strutted processes in 10 μm, 5-6.

Analysed material: Argentina, Province of Chubut, San José, – 10.06.81, sample nº 55; Isla de los Pájaros, 08.25.82, sample nº 75; Tehuelche, 06.21.82, sample nº 122, prep. 1.

Distribution in Argentina: Müller Melchers, 1953a: 465, Necochea, Province of Buenos Aires (=*Coscinodiscus punctiger*); 1953b: 9, Necochea, Province of Buenos Aires (=*Coscinodiscus punctiger*). Lange *et al*, 1983: 12, Mar del Plata Harbour, Province of Buenos Aires (=*Thalassiosira angstii*). Hasle, 1983: 595, Quequén Harbour, Province of Buenos Aires and 40º 49' S – 53º 43' W. Lange, 1985: 365, 38º 12' S – 57º 15' W; – 39º54'S – 54º 11' W.

Thalassiosira rotula Meunier
Figs. 2H and 24-27
Meunier, 1910: 264, Pl. 29, Figs. 67-70;
Syvertsen, 1977: 99-107,
Figs. 1-18;
Hallegraeff, 1984: 499,
Figs. 9 a-c.

The valve surface is convex, ornamented by radial ribs and areolae. The central and marginals areolae are hexagonal, the others, not well defined, are elongated in the radial direction, Fig. 24. The strutted tubular processes are short, prolonged towards both sides of the valve surface, arranged as follows: many of them form a cluster in the centre, Figs. 25 and 27, some are uniformly scattered over the valve, Fig. 24 and the others form some edge rings, Fig. 26. The labiate processes is prolonged towards the outer part and is placed on the valve edge.

Measurements: diameter, 35-42 μm; valve centre, areolae in 10 μm, 16-17; valve edge, areolae in 10 μm, 20-23; marginal strutted proceses in 10 μm, 7-10.

Analysed material: Argentina, Province of Chubut; Tehuelche, 09.16.82, sample nº 78.

Distribution in Argentina: Balech, 1962: 19, 41º 05' S – 62º 10' W (= *Thalassiosira rotula?);* 1976: 53, 38º 57' 3" S – 51º 38' 5" W (=*Thalassiosira rotula* ?). Lange *et al*, 1983: 16, Mar del Plata Harbour, Province of Buenos Aires, 38º 12' S – 57º 15' W; 38º 21' S – 57º 00' W; 38º 29' S – 56º 44' W; 38º 47' S – 56º 14' W; 39º 23' S – 55º 11' W. Lange, 1985: 365, 38º 12' S – 57º 15' W; 39º 59' S – 54º 11' W.

Thalassiosira simonsenii Hasle and Fryxell
Figs. 2G and 17-19
Hasle and Fryxell, 1977: 23-24,
Figs. 26-34, 97;
Lange *et al*, 1983: 13-14,
Figs. 13-14.

The valve surface is flat, ornamented by areolae arranged in linear rows. The central areolae are smaller than the ones on the margin. The valve mantle is oblique with thick ribs, Fig. 19. There is a strutted process placed at one side of the central areola, Fig. 18, and others alternatively arranged in two outer marginal rings, Fig. 19. There are two labiate processes, radially oriented, placed at 180º, with quite prolonged outer tubes, Fig. 18. There is a variable number of occluded processes forming an edge ring which includes the labiate processes, Figs. 17 and 18.

Measurements: diameter, 24-28 μm; valve centre, areolae in 10 μm, 7-8; marginal strutted processes in 10 μm, 6-8; occluded processes in 10 μmm, 4; ribs in 10 μm, 10-15.

Analysed material: Argentina, Province of Chubut; San José, 10.06.81, sample nº 55.

Distribution in Argentina: Lange *et al.*, 1983: 14, 38º 12' S – 57º 15' W; 38º 21' S – 57º 00' W; 38º 29' S – 56º 44' W; 38º 47' S – 56º 14' W; 39º 05' S – 55º 43' W; 39º 59' S – 54º 11' W. Lange, 1985: 365, 38º 12' S – 57º 15' W; 39º 59' S – 54º 11' W.

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